Bacteria → Gm+ → Rod → Aerobe → Pseudomonas

**Pseudomonas aeruginosa**

* Gm- | Lactose/glucose non-fermenter (can grow in lack of O2 if NO3 is available) | Oxidase +
* Hemolytic | Motile (via 1 flagellum)
* Nocosomial pathogen | Yellow-green mucous
* Ubiquitous in soil/H2O + part of normal human flora
* High tolerance to variety of physical conditions
* Virulence Factors
  + Fimbriae: ↑ adherence | Protease: ↑ tissue breakdown
  + Alginate: acts as adhesion to ↓ phagocytosis + antibiotic susceptibility + ↑ biofilm formation
  + Hemolysin | LPS | Pyocyanin: pro-inflammatory
  + Toxins: Exoenzyme S (ADP-ribosylating of variety of proteins)
  + Exotoxin A (ADP-ribosylating of eukaryotic elongation)
* Pathophysiology
  + Colonization → Chronic: ↑ biofilm mutants | few virulence factors | Immune-med. Damage
    - → Acute: Quorum sensing → ↑ Virulence factor | Protease/Toxin Damage tissue
* Clinical Implication
  + UTI ← result of catherization
  + RTI ← Esp. with CF patients
  + Skin Infection ← Esp. in burn wounds
  + Bacteremia + Endocarditis ← if disseminated infection (esp. in IVDA)
  + Ear Infection ← Ext. otitis + Chronic otitis media + Maligned ext. otitis
* Diagnosis
  + 1) Pyoverfin – Fluoroscent under UV light (esp. in low-iron content)
  + Pyocyanin – “blue-pus” due to suppurative inf.
  + Characteristic Fruity Odor
  + 2) Culture
  + 3) PCR
* Treatment (Problematic due to ↑ R to antibiotics)
  + Fluoroquinolones
  + Aminoglycosides
  + 3rd gen β-Lactams (extended spectrum Cephalosporins)
  + Vaccine: Yearly polyvalent conj. Vaccine → positive CF patient results

Bacteria → Gm+ → Rod → Aerobe → Burkholderia

* 3 human-relevant ones
  + B. mallei → glanders (RTI)
  + B. pseudomallei → mallioidosis (skin injury)
  + B. cepacia
    - ↓ UTI | ↓ Septicemia | ↑ Pulmonary Infection, esp. in CF = compared to Pseudomonas
    - T: Trimethoprim-sulfamethoxazole